

This article was downloaded by: [HEAL-Link Consortium]

On: 7 June 2011

Access details: Access Details: [subscription number 786636649]

Publisher Routledge

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Educational Research

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title~content=t713699076>

Developing a five-stage model of learning in *Second Life*

Gilly Salmon^a; Ming Nie^a; Palitha Edirisingha^a

^a E-learning and Learning Technologies, University of Leicester, UK

Online publication date: 14 May 2010

To cite this Article Salmon, Gilly , Nie, Ming and Edirisingha, Palitha(2010) 'Developing a five-stage model of learning in *Second Life*', Educational Research, 52: 2, 169 – 182

To link to this Article: DOI: 10.1080/00131881.2010.482744

URL: <http://dx.doi.org/10.1080/00131881.2010.482744>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.informaworld.com/terms-and-conditions-of-access.pdf>

This article may be used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

Developing a five-stage model of learning in *Second Life*

Gilly Salmon*, Ming Nie and Palitha Edirisingha

E-learning and Learning Technologies, University of Leicester, UK

(Received 21 July 2009; final version received 20 November 2009)

Background: In the 1990s, Salmon developed a five-stage model for enabling and scaffolding remote groups to work and learn together using asynchronous bulletin boards. The model has informed online learning and development practice across different levels and education for online and blended learning.

Purpose: This paper reports our testing of the usefulness and relevance of the model for *Second Life* (SL).

Programme description and sample: Our case studies included students and tutors from three different disciplines: Archaeology, Digital Photography and Media and Communications. For the first case study, we collaborated with a postgraduate distance learning course in Archaeology at the University of Leicester. The second case study involved a campus-based undergraduate course in Digital Photography at the London South Bank University. The third case study was of a postgraduate campus-based course in Media and Communications.

Design and methods: In each study, we developed artefacts and activities (SL-tivities) for students and tutors, to enable them to interact in groups. The SL-tivities were designed based on the five-stage model to provide scaffolding of learning in a group. Using qualitative methods, we studied students' and tutors' engagement with SL-tivities and their learning experiences at each stage of the model. We captured data through semi-structured interviews and from chat logs in SL, and mapped student dialogue against each stage of the model. We analysed the data using cognitive mapping, created causal understanding of the individuals and the groups and their changing views, feelings and experiences.

Results and conclusions: The case studies gave us examples of learning opportunities in SL at each stage of the model. Our initial study showed that using a structured model for scaffolding learning in groups has value in a 3D multi-user virtual environment such as SL, as well as in text-based asynchronous environments. The model helps to inform design and delivery so that learners' and teachers' confidence in each other and in the environment builds up and that they work productively with each other. We continue to build further research using SL-tivities and the five-stage model to explore and develop further understanding of its applicability.

Keywords: *Second Life*; five-stage model; 3D MUEs; collaboration; online socialisation; online identity

*Corresponding author. Email: gilly.salmon@le.ac.uk

Introduction

During the 1990s, Salmon researched, designed, deployed and tested a five-stage model (Figure 1) for teaching and learning through online networking. She tested it at the Open University with tutorial groups whose members communicated through asynchronous bulletin boards based on FirstClass conferencing software. The model, with examples of its application, was published in *E-moderating* (Salmon 2000, 2004). She also studied the design of learning tasks for groups at each stage of the model, again for asynchronous online discussion forums, and published *E-tivities* (Salmon 2002). With David Jaques, she wrote later on how to use the model in blended teaching and learning, in *Learning in Groups* (Jacques and Salmon 2007).

Her five-stage model has informed online learning and development practice across many levels from school pupils to postgraduate research students, and especially in online and blended learning in higher and professional education. It has served disciplines ranging from arts to science and practice-based subjects such as nursing and management. Although, more recently, wikis and blogs have been deployed, its applications have been based mainly on text and asynchronous conferencing (Skinner 2009; Kovacic, Bubas, and Zlatovic 2008; Pettenati and Cigognini, 2009).

In this paper, we describe developments and discuss findings from three case studies of testing the model's applicability to teaching and learning in *Second Life* (*Second Life* and Linden Lab are trademarks of Linden Research, Inc.). We summarise the model and explain the nature of *Second Life* (SL), a 3D multi-user virtual environment.

Salmon's five-stage model in brief

Stage 1 (at the base of the flight of steps) includes individuals' essential prerequisites for effective participation: access and the ability to benefit from remote group work

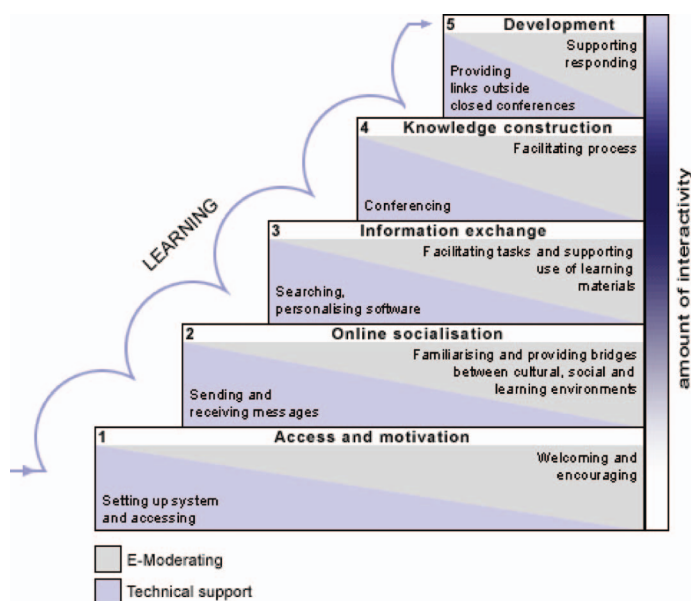


Figure 1. Five-stage model of teaching and learning online (Salmon 2004, 29).

for learning. Stage 2 involves individuals establishing a personal online identity and then finding others with whom to interact. At Stage 3, participants give and receive relevant and useful information about the course, and undertake course-related learning tasks. Up to and including Stage 3, a form of co-operation occurs through support by other participants for each person's goals. At Stage 4, more complex constructive tasks are possible, discussions occur and the interaction becomes more collaborative. At Stage 5, participants look for more benefits from the system; they want help in achieving their own goals, in exploring how to integrate their online experiences into other forms of learning and in transferring and applying their learning. At this stage, sophisticated individual learning may occur that includes reflection on and transfer of knowledge.

Each stage requires participants to master technical skills, shown at the bottom left of each step. Each stage calls for different human intervention skills (e-moderating), shown at right top of each step. The 'interactivity bar' running vertically along the right of the flight of steps suggests the intensity of interactivity that can be expected between the participants at each stage. At Stage 1, individuals interact only with one or two others. After Stage 2, the number of those with whom they interact – and the frequency of these interactions – gradually increases. In Stage 5, they often return to more individual learning pursuits.

The nature of 3D Multi-User Virtual Environments and *Second Life*

3D Multi-User Virtual Environments (3D MUVes) provide virtual three-dimensional spaces, tailored by their designers, which can accommodate more than one user at a time. Many virtual games are played out in such spaces, but our interest is in *Second Life (SL)*, a 3D social software application. Its developers, Linden Lab in California, say, 'It is a free online virtual world imagined and created by its residents' (<http://secondlife.com/whatis>).

SL was the third most popular social software application in the UK in 2009, after *Facebook* and *YouTube*. *SL* is by far the most widely used 3D MUVE for teaching and learning (Warburton 2009) and hundreds of universities, mostly in the UK and US, have a presence in *SL* (Kirriemuir 2008). As Warburton (2009, 415) notes 'a virtual world [like *SL*] provides an experience set within a technological environment that gives the user a strong sense of being there'.

SL is a social environment, not a game; its participants each have at least one avatar (a virtual representation of themselves) able to move around in the 3D environment and interact with other avatars. Avatars do more or less whatever they like, including teaching and learning (Salmon and Hawkrigge 2009). Potentially, *SL* provides very powerful new cultural experiences for learning and for groups to work together in innovative and engaging ways (Salmon 2009).

However, reflecting on the experience of developing the Shome Park Programme (SPP), Twining suggested that '... open virtual worlds are unclaimed spaces as far as education is concerned—educators have not yet established norms of how to support learning within them' (2009, 503). We agree that a key challenge is to design educational activities in virtual worlds, while exploiting the social nature of the visual environment.

Testing Salmon's model in *Second Life*

Instead of designing for learning in *SL* from 'scratch', we chose to test the five-stage model that had proved so useful in text-based 2D environments. Within MOOSE

(MOdelling Of Second life Environment, www.le.ac.uk/beyonddistance/moose), a JISC-funded research project, our three case studies tested the model's usefulness in relation to teaching and learning in *SL*. They involved students and tutors from three courses at two HE institutions: at the University of Leicester, a postgraduate distance learning course in Archaeology and a postgraduate campus-based course in Media and Communications, and, at the London South Bank University, a campus-based undergraduate course in Digital Photography.

Development of artefacts and activities in SL

We supported the *SL* tutors in their design of activities in *SL* (*SL*-tivities) based on the model's stages, including interesting collaborative tasks, thus scaffolding students' learning and group work. We ensured that artefacts were built in *SL* to provide 'a stimulus or a start (the "spark") to the interaction' (Salmon 2002, 4).

Case Study 1

At Leicester, the Department of Archaeology developed two artefacts to support learning about the concept of using space and landscape. One simulated an aspect of the lives of ancient Saami people in Northern Scandinavia. The other simulated a village of the Kalasha, an ethnic group from the Hindu Kush Mountains in the northwest of Pakistan. In both Saami and Kalasha cultures, access to social spaces depends on the individual's gender and social status.

Students were inducted into *SL* through creating their avatars and given opportunities to navigate around the Saami tent and Kalasha village, see the layout and division of the space, and explore where they could and could not go according to the gender assigned to their avatars. They were encouraged to interact with each other (avatar: avatar) about what they found, experienced, thought and felt.

A version of the Saami tent is available as an open educational resource (<http://slurl.com/secondlife/Media%20Zoo/177/222/24/>) under the OTTER (Open, Transferable, Technology-Enabled Educational Resource www.le.ac.uk/otter) project.

Case Study 2

At London South Bank, the Department of Digital Photography deployed 'virtual story cubes' for teaching. Students as avatars practised taking snapshots in *SL*, using camera control commands and changing *SL* 'environmental' settings to take high-quality digital photographs. They 'set off' to visit different islands in *SL* and captured a variety of digital images representing different subcultures. They learned how to create a cube with their pictures and manipulate it by changing the size, the texture and moving it. Student avatars then demonstrated their individual cubes to others and shared experience about places they had visited and why they had taken the photos. Finally, they put all the individual cubes together and created illustrated stories from them, negotiating on the shape of the combined cubes, the order of them and which sides to show.

Case Study 3

At Leicester, the Media and Communications Department designed two *SL*-tivities to enable students to investigate digital identity issues. Avatars were teleported to

different places in *SL* where they met and interacted with others. They were teleported back to the university's Media Zoo Island to share together news of what and whom they had encountered and how their experiences had enhanced their understanding of digital identity.

Research methodology

As this was an early study, students were recruited on a voluntary basis. Their engagement with *SL*-activities and learning experiences at each stage of the model was studied using qualitative methods. We captured data from the students in two ways. We conducted semi-structured interviews, lasting 40–60 minutes, focussing on their personal experiences of learning and using *SL*, and on contributions to their learning at each stage of the five-stage model. We recorded the chat logs of students' discussion in each teaching session. The chat logs enabled mapping of student dialogue against each stage of the model, going back to Salmon's original research.

Cognitive mapping was the method used to develop the original five-stage model. We analysed the interview data by using cognitive mapping (Bryson et al. 2004), to create unique visual causal representations of individuals and groups and their changing views, feelings and experiences. The methodology is grounded in theories of personal constructs (Kelly 1955), and supported by Decision Explorer software (www.banxia.com/demain.html).

When conducting *SL* related research, there are ethical considerations in collecting and using data from chat logs, observations and the use of images of avatars. We ensured that participants knew how data would be used and that we had their informed consent.

Findings: the five-stage model in *Second Life*

Stage 1: Access and motivation

Gaining access is an essential precondition for learning in any online environment. By comparison with simpler text-based 2D environments such as computer conferencing, *SL* presents additional challenges but also advantages. Participants must create their avatars and learn to manipulate them in *SL*. MOOSE showed the importance of preparing learners in *SL* itself, helping them to acquire the basic skills of moving, navigating and communicating effectively. Acquiring these avatar-driving skills is a more complex process than being inducted into text-based learning environments, which feel familiar to e-mail users. However, for a small greater investment, *SL* skills lead to exciting, motivating and fun experiences for participants.

Stage 1 applies equally to students and their tutors (*SL*-moderators). We found that it was best to split the stage into two steps:

Step 1: Learning individually

The first step focuses on helping individuals to gain access to *SL*, creating an avatar and choosing its avatar name, logging on, teleporting, movements and group communication tools. We developed a MOOSE guide for participants to work through at their own pace (Wheeler and Salmon 2008). The guide incorporates *YouTube* videos that demonstrate the basic skills. Students told us that they found this guide useful and the videos easy to follow.

Step 2: Learning in a group in-world

However competence in more sophisticated in-world skills such as movement including flying, gestures, navigation, camera control, private chat, searching and use of simple development tools need to be developed. Mastering such skills in *SL* is a prerequisite for students to appreciate the whole environment, to feel comfortable and confident in exploring its resources independently, and to engage later in *SL*-tivities.

We provided a one-hour training session for students and staff, delivered in-world, avatar-to-avatar. Participants were shown and practised skills useful for taking part in *SL*-tivities. Students appreciated the opportunity to have an in-world training session, especially to avoid 'getting lost' and for building confidence in the environment. We consider this gaining of personal control and confidence a key prerequisite for motivating them to return and take part.

Students also appreciated the opportunity to learn in an avatar group and interact with others at the same level of understanding, through their avatars. The nature of engagement in *SL* is somewhat different from that of text-based asynchronous discussion forums, where socialisation with others occurs via postings, reading and replying to each other, possibly over days or weeks. However, The 3D and immediacy of *SL*, the realistic feel to the artefacts and the co-presence immersion result in the personal experience of socialisation in *SL* 'feeling' similar to that of real life (RL). This co-presence in *SL* means that opportunities for socialisation are available from the moment the participants meet each other in-world. They demonstrated high motivation to engage with each other.

We conclude that it is beneficial to build in-world skills development for small groups of learners together from Stage 1, and ensure that participants meet each other's avatars in the first group training session, rather than attempt individual training for everyone. The Stage 1 experience contributes to continuing access and motivation to continue, and provides the basis for more complex avatar: avatar interactions at Stage 2.

Stage 2: Online socialisation

Stage 2 of the original five-stage model involves participants establishing their online identities, finding others with whom to interact online, understanding the nature of the online environment and how it is used for learning, and developing trust and mutual respect to work together at common tasks. All of these are necessary for Stage 2 in *SL* but perhaps especially the establishment of online identity through avatars, which is a more complex experience. *SL* presents opportunities as well as challenges for establishing online identity.

Our study found that for some participants the visual appearance of their avatar on the screen and their learning to 'drive' it are powerful enough for them to feel that the avatar is part of themselves. One participant said that she immediately 'felt attached to her [the avatar]'. Another said, 'I feel like I am an avatar' and a third, 'my avatar is a fantasy extension of me'. A significant milestone is reached when participants begin to feel that they are establishing a new and coherent identity through their avatars. This critical moment took longer for some than others.

Meeting other avatars helps develop personal avatar identity. We ensured that, by the end of Stage 1, participants had each constructed their first avatar. When they ventured around *SL* and met other avatars, they began to realise the social nature of

the immersive world; the interactions with other avatars in *SL* ‘felt’ real. For example, one participant felt threatened when an avatar that she met offered to teleport her to another place in *SL*. Another participant wanted to change the look of her avatar when she met an avatar with similar looks and outfit!

We plan more *SL*-tivities to enable personal and group development through participants focusing on their avatars and developing a sense of ‘inhabitation’ for future projects. We recommend that sessions should include activities such as changing the appearance and making modification to avatars, animating avatars by learning how to make gestures and movements, taking avatars shopping and field trips to different places in-world, by interacting with other avatars living in *SL*, and sharing, exchanging and reflecting on the in-world experiences.

In the original five-stage model, online socialisation stands for more than merely ‘socialising’. It includes understanding how being online contributes to learning for *their* topic, *this* course, *this* learning group. Our study concludes that *SL* sessions offer two more ways for socialisation than in text-based environments. The first is enabled by artefacts available in *SL*, which encourage avatars interest and dialogue. The second is through the meeting, greeting and seeing the avatars of others, i.e. impactful co-presence. As Meadows observed identity is a vital aspect to consider in developing learning activities in *SL* (Meadows 2008).

SL offers opportunities for socialising around artefacts that cannot be provided in text-based environments. For example, Box 1 is a conversation in text between avatars (students) gathered around the Saami tent.

Our analysis showed that there was laughter in the early *SL* sessions. In text-based environments, humour can be difficult to achieve until the group is well established. In Box 2, students are joking when they can’t get into the Saami tent.

Observation and interviews with participants showed that they were aware of *SL* as a *social* environment from the very start of their participation. They reported that

Box 1: Students commenting on the artefacts around the Saami tent.

[6:55] Avatar 1:¹ I like the crackling fire :)
 [6:55] Avatar trainer: my pot over the fire is new! It cost me \$L155.
 [6:55] Avatar 1: Oh, how nice! What are you cooking? :)
 [6:56] Avatar trainer: some special broth!
 [6:56] Avatar 1: The rugs look so real.
 [6:57] Avatar trainer: I knitted them the weekend that’s why!
 [6:57] Avatar 1: You’re very talented.
 [6:57] Avatar 2: :-)
 [6:57] Avatar trainer: Well, some people have the skills! :-)
 [6:57] Avatar 1: Do you have to knit in the middle of the tent or in the men’s section?

Box 2: Humour and laughter in *SL*.

[7:09] Avatar facilitator 1: Well I can’t move at all – I think I’m a lost reindeer
 [7:10] Avatar 1: No luck getting in?
 [7:11] Avatar facilitator 1: Let’s try again – we’re all blocked from somewhere. It shows how strong these cultural conventions are!
 [7:11] Avatar 1: I think we need to make our own tent :)
 [7:12] Avatar 2: No problem :-)

Box 3: Self-disclosure in *SL*.

[7:00] Avatar 3: Are all of you taking the theory module?
 [7:00] Avatar 2: Yes.
 [7:00] Avatar 1: I was but deferred it because I was in the hospital ... so I'll be starting again in July.
 [7:00] Avatar 2: Are you well again?
 [7:01] Avatar 1: Yes, thank you!
 [7:01] Avatar Trainer: I need to pop away and set something up please keep chatting
 [7:01] Avatar 1: Are you both from the UK?
 [7:01] Avatar 5: No, I'm from Germany. And you?
 [7:01] Avatar 2: I'm from the US.
 [7:02] Avatar 3: I'm from Germany as well, but living in France.
 [7:02] Avatar 1: Wow :)
 [7:02] Avatar 2: Where from?
 [7:02] Avatar 1: New Jersey
 [7:02] Avatar 3: Born in Freiburg, but grew up in Kempten, in Bavaria. How about you?
 [7:02] Avatar 2: I've been to Virginia once, I really liked it.
 [7:03] Avatar 1: Yes, Virginia's pretty, I like it too.
 [7:03] Avatar trainer: OK I'm back – I do not want to stop you but I'll have to!
 [7:03] Avatar 1: I've been to Munich and really liked it.
 [7:03] Avatar 2: I live in Sindelfingen near Stuttgart, but I was born in Munich.

Box 4: Sharing personal feelings in *SL*.

[6:51] Avatar trainer: I'm very excited and nervous!
 [6:51] Avatar 1: I'm very nervous :)
 [6:51] Avatar trainer: This is the first time I have helped someone else teach in here so please be patient with us!
 [6:52] Avatar 1: Of course!
 [6:52] Avatar 2: And I'm nervous, too!

SL allowed them to get to know each other better and faster than in text-based environments. As one student put it, 'due to the interaction, you quickly sort of get to know somebody, like E, she is very polite, very nice, so I got this first image of her'. A view of others' characteristics occurred earlier and more easily than in text-based environments, where there is often some discomfort and much more effort needs to be put into establishing presence and trust (Salmon and Lawless 2006). The characteristic recognition by new avatars of the high social presence encourages self-disclosure; they express feelings and emotions and they contribute further to online socialisation and group building.

Box 3 shows an example of self-disclosure in *SL*. This happened in the in-world training session where the avatars of a group of distance learners met in *SL* for the first time. They quickly started sharing some aspects of their personal life with each other without prompting by the *SL*-moderator.

Box 4 is an example in which avatars of a group of distance students, in their first teaching session in *SL*, shared their feelings.

Being in an immersive virtual environment, with interaction through avatars, as well as making timely and seamless conversation, are all approximations of real life, and enable humour to bubble up easily. Box 5 is an example of humour that came through naturally during a teaching session.

Box 5: Humour during a teaching session in *SL*.

[7:41] Avatar 1: I feel like I am in your company
 [7:42] Avatar 1: Like a real class
 [7:42] Avatar 2: Yes, a part of a group
 [7:42] Avatar facilitator 1: Well, I feel like a prune standing up here
 [7:42] Avatar 3: It's less anonymous
 [7:42] Avatar 1: ha ha
 [7:42] Avatar 3: Sit down!
 [7:42] Avatar 2: :)
 [7:42] Avatar facilitator 1: I'm not sure I know how to sit down yet! It might be embarrassing!
 [7:43] Avatar 1: We won't laugh. :)
 [7:43] Avatar 3: Right-click on sit
 [7:43] Avatar facilitator 1: Thanks – that's helpful. But I might fly instead ...

The Media and Communications students' avatars had no prior contact before meeting in *SL*. They were not informed which avatar was driven by a tutor and which by a student, nor did they try and determine RL roles during their *SL* sessions. We conclude that the avatars did not find it necessary either before or during the *SL* sessions to investigate each other's RL roles. However, it became apparent through behaviours!

Cognitive mapping revealed that tutors' avatars interacting with students' avatars within the immersive *SL* environment created an equal relationship, breaking down the old tutor-student hierarchical relationship. Again, although this is a known phenomenon in text-based environments, it was most marked and happened quickly in *SL*. One tutor explained that *SL* enabled the students and tutors to move away from traditional structures (buildings, classrooms), timetables, rules and regulations and modes of teaching and learning so typical of the higher education environment, to a new approach. The development of equal relationships, where preconceptions about who is who change, contribute to the start of a 'virtual third culture' at the online socialisation stage (Salmon 2002).

Stage 3: Information exchange

The experience of information exchange in *SL* is rather different from that in the original five-stage model although the key features remain. In *SL*, it is characterised by questions and responses occurring in rapid successions similar to that occurring in instant messaging forums, but with much more context from avatars' gestures and movements and reference to artefacts in the *SL* space. The conversation pattern is similar to that which occurs in face-to-face meetings rather than on asynchronous bulletin boards. Conversely, in bulletin boards, participants have the option and time to reflect and compose their responses, but in *SL* they need to compose their responses and ask questions based on what they already know about the subject under discussion. They need to do this quickly or they will get 'left behind'.

In our study, we identified two types of information exchange, both of which are features of Stage 3 of the five-stage model: sharing and recommending information to others and helping others to achieve their goals. Box 6 is part of a student discussion that begins with a question 'Can you recommend any good places in *SL* that others can visit?' This is a direct request for information exchange. The students

Box 6: Offering information to others.

[7:47] Avatar trainer: did anyone find any good places they would like to recommend others to visit before next week?
 [7:47] Avatar facilitator 3: and photo galleries as well
 [7:47] Avatar 5: Alice in wonderland, or the little circus ...
 [7:48] Avatar 5: there's a lion to sit on!
 [7:48] Avatar 8: okay, that's fairly amazing
 [7:48] Avatar 7: did you take a picture?
 [7:48] Avatar 5: no I was too busy sitting on it
 [7:48] Avatar 8: I've seen a dragon!
 [7:49] Avatar 5: can you sit on it?
 [7:49] Avatar trainer: OK BACK TO THE CLASSROOM!
 [7:49] Avatar 6: I saw a whale ...
 [7:49] Avatar 8: not so sure

Box 7: Helping others find their way around the Kalasha village.

[7:46] Avatar 3: I can go up to the mountain top, isn't this limited to men only?
 [7:48] Avatar facilitator 2: in theory you shouldn't be able to go up the mountain top – mountains are pure, so for men only
 [7:48] Avatar 3: Can you enter the hut, V?
 [7:48] Avatar facilitator 2: but try and see what your permission lets you do
 [7:48] Avatar 4: I'll try
 [7:49] Avatar 3: Can I open the door?
 [7:50] Avatar facilitator 1: yep just click on it

started talking about their encounters with artefacts in *SL*. They were easily able to ignore the *SL*-moderators' attempts to get them back on track!

In the example in Box 7, the tutor is helping the students, and students are helping each other, to navigate around the Kalasha village.

Stage 4: Knowledge construction

In our study, we identified two types of avatar behaviours likely to promote knowledge construction: collaborations and sharing, i.e. exchanging views and learning from each other to achieve a common goal. Unlike text-based environments, *SL* offers opportunities to build, create and develop objects collaboratively. Participants found the activity of building and developing virtual story cubes very interesting and engaging. They very much enjoyed the group support, discussion and negotiation mediated through developing and putting together their story cubes.

The characteristics of the *SL* environment led to easy and productive processes and group work – qualities that are difficult to reproduce and require more effort to generate in text-based asynchronous environments. In Box 8, a group of students discuss and negotiate on in what shape they should put their story cubes together.

Boxes 9 and 10 demonstrate the need to create appropriate conditions for the smooth and regular flow of engagement and interchange. In Box 9, the *SL*-moderator facilitated knowledge construction through asking questions, promoting new topics, seeking more discussion and encouraging controversial views.

Box 8: Interacting and contributing towards a common goal.

[6:31] Avatar 8: how should we put them together? What shape?
 [6:31] Avatar 5: circle, so we can walk round it easily
 [6:31] Avatar 7: yep
 [6:31] Avatar 8: the viewer stands in the middle? Or outside?
 [6:31] Avatar 5: or a semi circle?
 [6:31] Avatar 9: good idea
 [6:31] Avatar 10: yeah a circle
 [6:31] Avatar 5: clever
 [6:31] Avatar 7: in the middle
 [6:31] Avatar 8: I'd go for middle
 [6:31] Avatar 8: let's do it
 [6:32] Avatar 5: and won't it be FUN to see the story on the outside!!
 [6:32] Avatar 8: I'm gonna start with a wonky circle
 [6:32] Avatar trainer: should we all stand in the middle as you build it around us?
 [6:33] Avatar 10: yes good idea . . . H . . . I think I am in the middle now
 [6:33] Avatar 6: looks very professional Avatar 4!
 [6:35] Avatar 8: now you think about the order

Box 9: E-moderating skills for facilitating knowledge construction in *SL*.

[7:09] Avatar facilitator 1: Who wants to start – A? (being alphabetical)
 [7:09] Avatar 3: All three of them, I guess.
 [7:09] Avatar facilitator 1: D – do you agree?
 [7:09] Avatar 2: All three, I suppose.
 [7:10] Avatar facilitator 1: E? Someone start arguing!
 [7:10] Avatar 1: I think it's socially structured, but maybe all three? It's neutral as far as gender goes I think.
 [7:10] Avatar 1: It's virtual so it's a little confusing
 [7:10] Avatar facilitator 1: Gender is an interesting one, as it is very easy to be transgender or opposite gender to real life, as we shall see next week
 [7:11] Avatar facilitator 1: Can we think about how far *SL* conforms to these kinds of approaches in turn?
 [7:11] Avatar facilitator 1: As far as I can experience it, *SL* uses Cartesian coordinates, so in that sense it tries to mimic the real world rather than do anything more creative
 [7:12] Avatar 3: But the same time it's three-dimensional, measurable and quantifiable.

In Box 10, the students achieved knowledge construction through following up each other's questions, keeping the discussion growing, and sharing and exchanging views.

Stage 5: Development

The example in Box 11 shows that students and tutors reflected on their experience of *SL* and the similarities and differences towards the end of a teaching session. They were able to take a meta-cognitive view of their learning through the 3D world.

In the final stage of Salmon's model participants aim to achieve personal goals and attempt to integrate their learning experience from the online environment into other forms of learning. There is potential for sophisticated individual learning at this stage.

Box 10: Knowledge construction through sharing and exchanging views in *SL*.

-
- [7:40] Avatar facilitator 2: ok, end of that PowerPoint – any questions about burial?
 [7:41] Avatar 3: Any differences between men and women?
 [7:41] Avatar facilitator 2: good question – no difference between men and women for actual burial, but the ancestor statues tend to be of men
 [7:42] Avatar trainer: Do they use different woods/components depending on prestige/status of the person buried? The pictures I saw (you showed me)... all look the same?
 [7:42] Avatar 3: Or colours on the statues?
 [7:43] Avatar facilitator 2: yes, interesting point – wood today in the Kalasha valleys is in short supply – deforestation by the Kalasha
 [7:43] Avatar 4: is the depth of burial very little as in European Muslim cemeteries
 [7:43] Avatar facilitator 2: this means that any wood that can be found is used, and also means that the production of ancestor statues is dying out
 [7:43] Avatar 1: Is that why they don't use coffins? The small supply of wood?
 [7:43] Avatar 3: Have they started using different material for the statues?
 [7:44] Avatar facilitator 2: and because wood rots away quite quickly when exposed, we don't really know so much about what happened some year ago, only very recent burials
 [7:44] Avatar facilitator 2: V first – the traditional burials and 'buried' – the coffins are placed above ground, and you'll see this in the photos next week
 [7:44] Avatar 4: understood
 [7:45] Avatar facilitator 2: E – the bodies are place in wooden 'coffins' and this is the traditional practice, the coffins are then just left above ground to rot away
 [7:45] Avatar 1: I see, thanks.
 [7:45] Avatar facilitator 2: however, recently Muslim practices are starting to prevail and bodies are having to be buried according to Muslim traditions
 [7:46] Avatar facilitator 2: A – interesting idea, but I haven't seen any trend at all to make statues out of different material. I will look out for this if I go there again soon though
 [7:46] Avatar 3: OK, then
-

Box 11: Reflecting on personal experience in *SL*.

-
- [4:26] Avatar facilitator 4: what do you think you have learnt about virtual identity from your experience in *SL*?
 [4:26] Avatar facilitator 5: I hope we all go on adventuring in *SL*
 [4:26] Avatar facilitator 4: So do I
 [4:27] Avatar facilitator 5: It has changed a lot for me. A whole new world has opened up for new teaching and research
 [4:27] Avatar 11: I think it's just like real life, but the difference is you can make it different
 [4:27] Avatar facilitator 4: why not change in real life? Maybe you will now
 [4:28] Avatar facilitator 5: I'm working in New York and having fun in *SL* with all of you. I'm here but I'm there too. Multiple spatiality
 [4:29] Avatar 12: I think I've got more chance to do something that I can't do or no chance to do in real life
-

Summary and recommendations

Our initial study shows that using a structured model for scaffolding learning in groups has value in 3D MUVES such as *SL* as well as in text-based asynchronous environments, to ensure that for learners, and teachers, *confidence in the environment and in each other builds up in a productive way*. The basic structure appears to hold good (Figure 2), but the potential at each stage is slightly different.

There is no need to separate the activities that support learning to benefit from using the technological platform from those needed to undertake course-related tasks and establishing a constructive learning group. Of course, at present *SL* is more

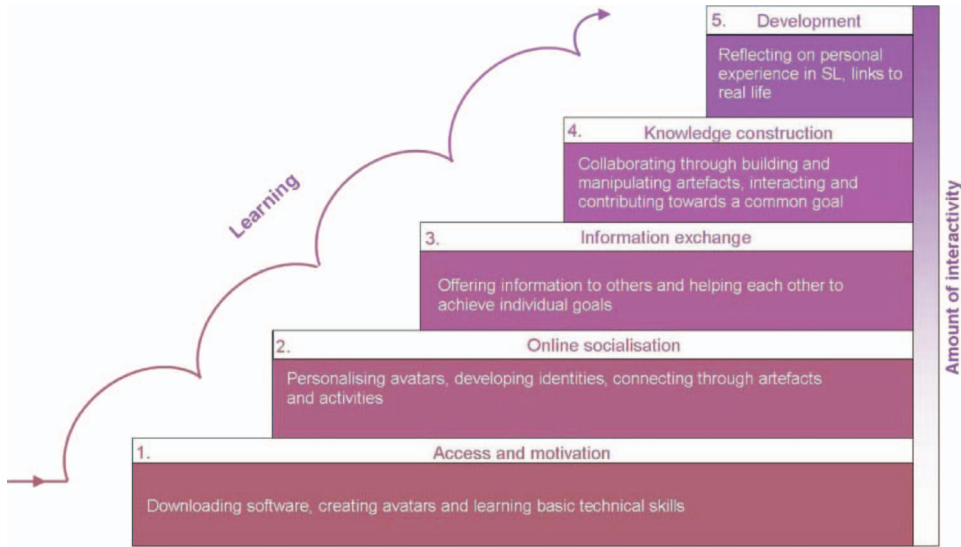


Figure 2. Five-stage model of teaching and learning in *Second Life*.

alien to some participants than bulletin boards are, and they need support and practice. This is an echo for many of us of how it was in the early days of bulletin boards! The key aim for *SL*-moderators should be to enable each student to become comfortable in his or her avatar's identity and 'at home' in the *SL* environment. Then the participants will learn to relate well and early with each other through their avatars. We noted that this is somewhat easier in *SL* and occurs more naturally through experience of interaction, once basic skills are acquired, than through asynchronous bulletin boards. However, learning designers should avoid missing out on the critical 'online socialisation' stage – it provides the building blocks in the scaffold for much more group learning later on.

Next steps

We are continuing to research into both *SL*-tivities and the social scaffolding of learning in *SL*, with on-campus and distance learners, through further studies focussed on the students' learning experience and the use of *SL* in established programmes of study, as in our projects DUCKLING (Delivering University Curricula: Knowledge, Learning and INnovation Gains, www.le.ac.uk/duckling) and SWIFT (Second World Immersive Future Teaching, www.le.ac.uk/swift). We plan to continue to illuminate the benefits of the five-stages for *SL* and other Web 2.0 environments, and invite other teachers and researchers to explore these ideas and send us feedback on their findings.

Acknowledgements

We would like to thank the following organisations, institutions and individuals for funding, participating in and contributing to the development of the five-stage model: The Joint Information Systems Committee (JISC) in the UK for funding the MOOSE study; Colleagues at Beyond Distance Research Alliance, the University of Leicester, especially Professor David

Hawkrige, Simon Kear and Matthew Wheeler; Dr Mark Pluciennik, Dr Ruth Young, Dr Gillian Youngs and Dr Tracy Simmons at the University of Leicester, Dr Paula Roush at the London South Bank University; Student participants from the University of Leicester and the London South Bank University.

Note

1. The names of all avatars have been replaced by numbers to respect their anonymity.

References

- Bryson, J.M., F. Ackermann, C. Eden, and C.B. Fin. 2004. *Visible thinking – unlocking causal mapping for practical business results*. London: Wiley.
- Jacques, D., and G. Salmon. 2007. *Learning in groups: a handbook for face-to-face and online environments*. 4th ed. Abingdon: Routledge.
- Kelly, G. 1955. *The psychology of personal constructs*. New York: Norton.
- Kirriemuir, J. 2008. A spring 2008 'snapshot' of UK higher and further education developments in Second Life. Eduserve Foundation. <http://www.scribd.com/doc/7063700/A-Spring-2008-snapshot-of-UK-Higher-and-Further-Education-Developments-in-Second-Life>
- Kovacic, A., C. Bubas, and M. Zlatovic. 2008. E-tivities with a wiki: Innovative teaching of English as a foreign language. <http://eunis.dk/papers/p87.pdf>
- Pettenati, M.C., and M.E. Cigognini. 2009. Designing e-tivities to increase learning-to-learn abilities. eLearning Papers, University of Florence. <http://www.uh.cu/static/documents/RDA/Designing%20e-tivities%20increase.pdf>
- Meadows, M.S. 2008. *I, avatar: The culture and consequences of having a second life*. Berkeley, CA: New Riders.
- Salmon, G. 2002. *E-tivities: The key to active online learning*. London: Routledge Falmer.
- Salmon, G. 2009. The future for Second Life and learning. *British Journal of Educational Technology* 40, no. 3: 526–38.
- Salmon, G.K. 2000, 2004. *E-moderating: the key to teaching and learning online*. London and New York: Routledge Falmer.
- Salmon, G., and D. Hawkrige. 2009. Editorial: Out of this world. *British Journal of Educational Technology* 40, no. 3: 401–13.
- Salmon, G., and N. Lawless. 2006. Management education for the twenty-first century. In *Handbook of blended learning: Global perspectives, local designs*, ed. C.J. Bonk, and C.R. Graham. San Francisco, CA: Pfeiffer.
- Skinner, E. 2009. Using community development theory to improve student engagement in online discussion: A case study. *ALT-J* 17, no. 2: 89–100.
- Twining, P. 2009. Exploring the educational potential of virtual worlds – some reflections from the SPP. *British Journal of Educational Technology* 40, no. 3: 496–514.
- Warburton, S. 2009. Second Life in higher education: Assessing the potential for and the barriers to deploying virtual worlds in learning and teaching. *British Journal of Educational Technology* 40, no. 3: 414–26.
- Wheeler, M., and G. Salmon. 2008. *Second Life: Guide for learning group participants*. Leicester: University of Leicester. <http://tinyurl.com/mooseSLguides>